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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: CHING-WU CHU		Conf. No.:	6143
Application No.:	07/032,041	Art Unit:	1751
Patent No.:	7,056,866	Examiner:	Mark T. Kopec
Issue Date:	June 6, 2006	Docket No.:	053451.0001 (3)
For:	SUPERCONDUCTIVITY OF SQUARE-PLANAR COMPOUND SYSTEMS	Customer No.:	1200

Commissioner for Patents
Office of Data Management
Attention: Certificates of Correction Branch
P.O. Box 1450
Alexandria, VA 22313-1450

REQUEST FOR CERTIFICATE OF CORRECTION OF PATENT FOR PTO MISTAKE (37 C.F.R. § 1.322(a))

Attached, in duplicate, is PTO/SB/44 (also PTO 1050), the Certificate of Correction form. Upon reviewing the above-identified patent, Patentee's attorney noted a typographical error in claim 1 of the patent (col 18, line 30). Patentee respectfully requests that these errors be corrected.

The error for which correction is sought is an error made by the U.S. Patent and Trademark Office ("USPTO"). Enclosed are (1) Patentee's Response and Amendment, dated August 3, 2004 (Exhibit A), (b) Patentee's Substitute Specification including clean version of claims, dated August 3, 2004 (Exhibit B), and (c) the Index of Claims (Exhibit C). The Response and Amendment along with the Substitute Claims include a listing of the claims with

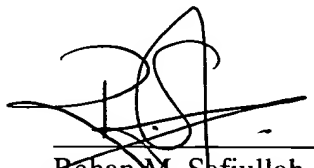
the correct formula. Original claim 56,[1] renumbered as final claim 1,[2] contains the correct formula: $(L_{1-x}M_x)_aA_bO_y$. Currently, the patent incorrectly shows subscript "1–*x*" as "*l*–*x*"—that is, the subscript should be the number "1" not the letter "*l*". The mistake is of such a nature that the meaning intended may not be readily apparent from the context of the claims and specifications; the error is thus potentially of consequence and a Certificate of Correction is proper and should be issued pursuant to the provisions of 37 C.F.R. § 1.322 and MPEP 1480.

Patentee believes that no fee is required because the mistake was on the part of the USPTO. Nonetheless, the Commissioner is hereby authorized to charge any additional fees which may be required or credit any overpayment to Deposit Account No. 16-2435. A duplicate copy of this sheet is also enclosed.

Issuance of a Certificate of Correction is believed appropriate and is respectfully solicited. Please send the Certificate to the undersigned.

Date: March 30, 2012

Respectfully submitted,



Rehan M. Safiullah, Reg. 63,506
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1111 Louisiana Street, 44th Floor
Houston, Texas 77002
Telephone: (713) 220-5800
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[1] *See* Exhibit A, Response and Amendment at 3 (Aug. 3, 2004).

[2] *See* Exhibit B, Substitute Specification at 26 (Aug. 3, 2004); *see* Exhibit C, Issue Classification (Oct. 17, 2005).

CERTIFICATE OF MAILING

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Rehan M. Safiullah

PTO/SB/44 (09-07)
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UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,056,866

APPLICATION NO.: 07/032,041

ISSUE DATE : June 6, 2006

INVENTOR(S) : Ching-Wu Chu

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

In the claims:

Claim 1 (column 18, line 30) the formula reading $[L_{l-x}M_x]_aA_bO_y$ should read $[L_{1-x}M_x]_aA_bO_y$

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1111 Louisiana St., 44th Floor, Houston, Texas 77002

EXHIBIT A

1751/41

CERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. 1.8(a)

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Name of Person Signing Certificate: Holly Tuynman

Date 08/03/2004 Signature

MAIL STOP AMENDMENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: CHING-WU CHU	§	Conf. No.:	6143
Filed: March 26, 1987	§	Art Unit:	1751
Serial No.: 07/032,041	§	Examiner:	Mark Kopec
For: SUPERCONDUCTIVITY IN SQUARE-PLANAR COMPOUND SYSTEMS	§	Docket No.:	CIP-81297
	§	Customer No.:	01200

RESPONSE AND AMENDMENT

Amendments to the Specification:

A substitute specification including original claims 1-15 is enclosed. The substitute specification includes the specification amendments that were offered by the Preliminary Amendment filed December 4, 1987. A marked-up copy of the substitute specification is also submitted which by underlining and strike-through shows all of the changes relative to the immediate version of the specification prior to the Preliminary Amendment of December 4, 1987. Further, the substitute specification includes one additional amendment at page 25 thereof in Table I which corrects the formula of $NbBa_2Cu_3O_{6+\partial}$ to instead read as -- $NdBa_2Cu_3O_{6+\partial}$ --. This corrects an obvious typographical error. The substitute specification includes no new matter.

Amendments to the Claims:

Please amend claims 56-57, 60-61, 65, 88-89 and 93.

Please cancel claims 16-55, 59, 63-64, 66-87 and 94.

Please add claims 98-99.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-15 (Cancelled)

16-55 (Cancelled)

56. (Currently Amended) A composition which is superconductive at a temperature of 70°K and higher, comprising:

a ~~sintered~~ metal oxide ~~complex~~ of the formula

$[L_{1-x}M_x]_aA_bO_y$

wherein;

"L" is ~~scandium~~, yttrium, lanthanum, ~~cerium, praseodymium,~~ neodymium, samarium, europium, gadolinium, ~~terbium~~, dyprosium, holmium, erbium, thulium, ytterbium, lutetium, or mixtures thereof; "M" is barium, strontium, ~~calcium, magnesium, mercury,~~ or mixtures thereof; "A" is copper, ~~bismuth, tungsten, zirconium, tantalum, niobium, vanadium~~; "x" is from about 0.65 to 0.80; "a" is 1; "b" is 1; and "y" is a value from about 2 to about 4 that provides the metal oxide ~~complex~~ with zero electrical resistance at a temperature of 70°K or above.

57. (Currently amended) The superconducting composition of claim 56, wherein "M" is barium ~~or strontium and "A" is copper~~.

58. (Previously presented) The superconducting composition of claim 57, wherein "x" is about 0.667.

59. (Cancelled)

60. (Currently Amended) The superconducting composition of claim ~~59~~ 58, wherein "L" is yttrium, lanthanum neodymium, samarium, europium, gadolinium, erbium or lutetium.

61. (Currently Amended) The superconducting composition of claim 56, wherein the metal oxide ~~complex~~ has the formula

$LM_2A_3O_{6+\partial}$

and ∂ is a number value from about 0.1 to about ~~4.5~~ 1.0 that provides the oxide complex with zero electrical resistance at a temperature of 70°K or above.

62. (Currently Amended) The superconducting composition of claim 61, wherein "M" is barium ~~or strontium, "A" is copper~~.

63-64 (Cancelled)

65. (Currently Amended) The superconducting composition of claim ~~64~~ 62, wherein "L" is yttrium, lanthanum neodymium, samarium, europium, gadolinium, erbium or lutetium ~~and "M" is barium.~~

66-87 (Cancelled)

88. (Currently Amended) A method for making a superconducting metal oxide ~~complex~~, comprising the steps of:

mixing solid compounds containing L, M, A and O in amounts appropriate to yield the formula $[L_{1-x}M_x]_aA_bO_y$ wherein "L" is ~~scandium,~~ yttrium, lanthanum, ~~cerium, praseodymium,~~ neodymium, samarium, europium, gadolinium, ~~terbium,~~ dysprosium, ~~halmium~~ holmium, erbium, thulium, ytterbium, lutetium, or a combination thereof; "M"

is barium, strontium, ~~calcium, magnesium, mercury~~ or a combination thereof; "A" is copper, ~~bismuth, titanium, tungsten, zirconium, tantalum, niobium, vanadium or a combination thereof~~; "a" is 1 to 2; "b" is 1; "x" is about 0.01 to about 1.0; and "y" is a value from about 2 to about 4 that provides the metal oxide ~~complex~~ with zero electrical resistance at a temperature of 40°K or above;

compacting the mixture into a solid mass by application of pressure from about 100 to about 30,000 psi;

heating the solid mass in air to a temperature of from about 800 to about 1000°C for a time sufficient to react the compacted mixture in the solid state; and

quenching the solid mass to ambient temperature in air.

89. (Currently Amended) The method of claim 88, wherein "M" is barium ~~or strontium and "A" is copper~~.

90. (Previously presented) The method of claim 89, wherein "x" is about 0.65 to about 0.80 and "a" is 1.

91. (Previously presented) The method of claim 90, wherein the mixture is compacted to a solid mass by application of pressure of from about 100 to about 500 psi.

92. (Previously presented) The method of claim 91, wherein the solid mass is heated under a reduced oxygen atmosphere of about 2000μ at a temperature of from about 820°C to about 950°C.

93. (Currently Amended) A material containing a sufficient quantity of a superconductive crystalline phase to cause the material to exhibit substantially zero electrical resistance at a temperature of 77°K or above; said crystalline phase composition having the formula $LM_2Cu_3O_{6+\partial}$, wherein "L" is ~~Se~~, Y, La, ~~Ce, Pr,~~ Nd, Sm, Eu, Gd, ~~Tb,~~ Dy, Ho, Er, Tm, Yb, Lu, or mixtures thereof; "M" is Ba, Sr or mixtures thereof; and ∂ is a value from about 0.1 to

about ~~4.5~~ 1.0 that provides the composition with zero electrical resistance at a temperature of 77°K or above.

94. (Cancelled)

95-97 (Not entered)

98. (New) The material of claim 93 wherein L is Y and M is Ba.

99. (New) The material of claim 93 wherein L is, Sm, Eu, Gd, Er, or Lu and M is Ba.

REMARKS

Responsive to the Office Action mailed May 27, 2004, Applicants have studied the Examiner's comments and the cited art. Claims 56-58, 60-62, 65, 88-93 and 98-99 are currently pending. In view of the following remarks, Applicants respectfully submit that the application is in condition for allowance.

All pending claims were rejected under 35 U.S.C. § 112, first paragraph for naming various elements from which it has been said no superconducting composition can be obtained. The independent claims which remain pending are claims 56, 88 and 93. All independent claims have been amended to delete from the elements listed for L the objectionable elements of Sc, Ce, Pr, Tb; to delete from the element listed for M the objectionable elements of Ca, Mg, Hg; to delete from the elements listed for A the objectionable elements of Bi, Ti, W, Zr, Ta, Nb and V. Not deleted as an M element is Sr. In this respect attention is directed to U.S. Patent 6,635,603 (copy enclosed) and Example 4 of the Table at column 8 thereof showing $Y(Ba_{1.5}Sr_{0.5})Cu_30_{9-S}$ as superconducting at Tc=87K. This disproves Dr. Engler's assertions as respects Sr not being a useful element as the M constituent of a superconductor.

By the above-discussed amendment it is believed that the 35 U.S.C. § 112 rejection has been overcome, and there being no further basis for rejection of claims 56-58, 60-62, 65, 88-93 and new claims 98-99, the claims should now be allowed.

The rejection of claims 29-41, 51, 52 and 76 under 35 U.S.C. § 112, first paragraph is now moot in view of the cancellation of these claims.

The rejection of claims 35-46 under 35 U.S.C. § 112, second paragraph is now moot in view of the cancellation of these claims.

The rejection of claims 35-46 and 67-68 under 35 U.S.C. § 102(a)1(b) and/or § 103(a) over Bednorz et al. or Michel is now moot in view of the cancellation of these claims.

CONCLUSION

Applicants respectfully submit that all issues and rejections have been adequately addressed, that all claims are allowable, and that the case should be advanced to issuance.

If the Examiner has any questions or wishes to discuss the claims, Applicants encourage the Examiner to call the undersigned at the telephone number indicated below.

Respectfully submitted

Charles M. Cox, Reg. No. 29,057

Date: Aug 3, 2004

AKIN GUMP STRAUSS HAUER & FELD LLP
1111 Louisiana, Suite 1900
Houston, Texas 77002
Telephone: (713) 220-5800
Facsimile: (713) 236-0822

EXHIBIT B

Marked-up Version of Substitute Specification

APPLICATION FOR PATENT

INVENTORS: CHING-WU CHU

TITLE: SUPERCONDUCTIVITY IN SQUARE-PLANAR COMPOUND SYSTEMS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This is a continuation-in-part of Serial No. 012,205, filed February 6, 1987, entitled "High Transition Temperature Superconducting Composition" which in turn is a continuation-in-part of Serial No. 006,991, filed January 26, 1987, entitled "Superconducting Compositions And Method For Enhancing Their Transition Temperatures By Pressure" which in turn is a continuation-in-part of Serial No. 002,089, filed January 12, 1987, entitled "Superconducting Composition and Method."

STATEMENTS REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] This invention was made with United States Government support under Grant No. DMR-8204173 awarded by the National Science Foundation and Grant No. NAGW-997 awarded by the National Aeronautics and Space Administration, and the United States Government has certain rights in the invention.

BACKGROUND OF THE INVENTION

[0003] This invention relates to superconducting compositions, i.e., compositions offering no electrical resistance at a temperature below a critical temperature; to processes for their production and to methods for their use; and to methods for increasing the superconducting transition temperature of superconducting compositions.

[0004] Superconductivity was discovered in 1911. Historically, the first observed and most distinctive property of a superconductive material is the near total loss of electrical resistance by the material when at or below a critical temperature that is a characteristic of the material. This critical temperature is referred to as the superconducting transition temperature of the material, T_c. The criteria by which a selection of the critical temperature value is determined from a transition in the change in resistance observed is often not obvious from the literature. Many past authors have chosen the mid-point of such curve as the probable

Pages 2-25
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CLAIMS

1. A superconducting metal oxide complex, having the formula $(L_{1-x}M_x)_a A_b O_y$, wherein "L" is scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dyprosium, holmium, erbium, thulium, ytterbium, or lutetium, or a combination thereof; "M" is barium, strontrium, calcium, magensium, mercury, or a combination thereof; "A" is copper, bismuth, titanium, tungsten, zirconium, tantalum, niobium, vanadium or a combination thereof:

"x" is from about 0.01 to 1.0;

"a" is 1 to 2;

"b" is 1; and

"y" is about 2 to about 4.

2. The oxide complex of claim 1 wherein "L" is yttrium, lanthanum, neodymium, samarium, europium, gadolinium, erbium or lutetium, "M" is barium or strontrium, "A" is copper, "a" is 1 and "x" is from about 0.65 to about 0.80.

3. The oxide complex of claim 2 wherein "M" is barium and "x" is about 0.667.

4. The oxide complex of claim 3 wherein "L" is yttrium, lanthanum or lutetium.

5. The oxide complex of claim 1 wherein the oxide complex has the formula

$$LM_2A_3O_{6+\partial}$$

and ∂ has a number value from about 0.1 to about 4.5

6. The oxide complex of claim 5 wherein "L" is yittrium, lanthanum, neodymium, samarium, europium, gadolinium, erbium or lutetium, "M" is barium or strontrium, "A" is copper.

7. The oxide complex of claim 6 wherein ∂ has a number value from about 0.1 to about 1.0.

8. The oxide complex of claim 7 wherein ∂ has a number value of from about 0.1 to about 0.5.

9. The oxide complex of claim 8 wherein "L" is yttrium, lanthanum or lutetium and "M" is barium.

10. A superconducting metal oxide complex having the formula $(L_{1-x}M_x)_a A_b O_y$, wherein "L" is scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, samarium europium, gadolinium, terbium, dyprosium, holmium, erbium, thulium, ytterbium, or lutetium, or a combination thereof; "M" is barium, strontrium, calcium, magensium, mercury,

or a combination thereof; "A" is copper bismuth, titanium, tungsten, zirconium, tantalum, niobium, vanadium or a combination thereof; "a" is 1 to 2; "b" is 1; "x" is from about 0.01 to 1.0; and "y" is about 2 to about 4; said complex made by a process comprising the steps of:

compressing a mixture of solid powdered compounds containing L, M, A and O in proportions appropriate to yield said formula;

heating the compressed powder mixture to a temperature of from about 800°C to about 1000°C for a time sufficient to react the compressed mixture in the solid state; and

quenching said reacted compressed mixture to ambient temperature.

11. The oxide complex of claim 10 wherein "L" is yittrium, lanthanum, neodymium, samarium, europium, gadolinium, erbium or lutetium, "M" is barium or strontrium, "A" is copper, "a" is 1 and "x" is from about 0.65 to about 0.80.

12. The oxide complex of claim 11 wherein the solid compounds containing L are L_2O_3, the solid compounds containing "M" are MCO_3 and the solid compounds containing A are AO.

13. The oxide complex of claim 12 wherein "M" is barium and "x" is about 0.667.

14. The oxide complex of claim 13 wherein the compressed powder mixture is heated under a reduced oxygen atmosphere of about 2000μ at a temperature of from about 820°C to about 950°C.

15. The oxide complex of claim 14 wherein "L" is yttrium, lanthanum or lutetium, "M" is barium and "A" is copper.

ABSTRACT

Described is a superconducting composition comprising an oxide complex of the formula $[L_{1-x}M_x]_aA_bO_y$ wherein L is lanthanum, lutetium, yttrium, or scandium; A is copper, bismuth, titanium, tungsten, zirconium, tantalum, niobium, or vanadium; M is barium, strontium, calcium, magnesium or mercury; and "a" is 1 to 2; "b" is 1; and "x" is a number in the range of 0.01 to 1.0; and "y" is about 2 to about 4. The oxide complexes of the invention are prepared by a solid-state reaction procedure which produces an oxide complex having an enhanced superconducting transition temperature compared to an oxide complex of like empirical composition prepared by a coprecipitation - high temperature decomposition procedure.

With an oxide complex prepared by the solid-state reaction of the invention a transition temperature as high as 100°K has been observed even under atmospheric pressure.

EXHIBIT C

Issue Classification	Application No.	Applicant(s)	
	07/032,041	CHU, CHING-WU	
	Examiner	Art Unit	
	Mark Kopec	1751	

ISSUE CLASSIFICATION

ORIGINAL		CROSS REFERENCE(S)							
CLASS	SUBCLASS	CLASS	SUBCLASS (ONE SUBCLASS PER BLOCK)						
505	125	505	126	490	500	780			
INTERNATIONAL CLASSIFICATION									
C 04B	101/00								
H 01L	39/12								
H 01B	12/00								
	/								
	/								

NONE
(Assistant Examiner) (Date)

(Legal Instruments Examiner) (Date) 8/17/05

Mark Kopec 11/08/04
(Primary Examiner) (Date)

Total Claims Allowed: 15

O.G. Print Claim(s)	O.G. Print Fig
1	1

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
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	3		33		63	8	93		123		153		183
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	5		35	7	65		95		125		155		185
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	7		37		67		97		127		157		187
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	29		59	12	89		119		149		179		209
	30	4	60	13	90		120		150		180		210

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Application No.: 07/032,041	§	Art Unit:	1751
Patent No.: 7,056,866	§	Examiner:	Mark T. Kopec
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the correct formula. Original claim 56,[1] renumbered as final claim 1,[2] contains the correct formula: $(L_{1-x}M_x)_aA_bO_y$. Currently, the patent incorrectly shows subscript "1–*x*" as "*l*–*x*"—that is, the subscript should be the number "1" not the letter "*l*". The mistake is of such a nature that the meaning intended may not be readily apparent from the context of the claims and specifications; the error is thus potentially of consequence and a Certificate of Correction is proper and should be issued pursuant to the provisions of 37 C.F.R. § 1.322 and MPEP 1480.

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Date: March 30, 2012

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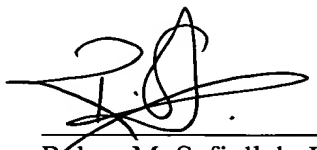

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Rehan M. Safiullah

PTO/SB/44 (09-07)
Approved for use through 08/31/2013. OMB 0651-0033
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

(Also Form PTO-1050)

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. : 7,056,866

APPLICATION NO.: 07/032,041

ISSUE DATE : June 6, 2006

INVENTOR(S) : Ching-Wu Chu

It is certified that an error appears or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

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1111 Louisiana St., 44th Floor, Houston, Texas 77002

EXHIBIT A

1751/41

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Name of Person Signing Certificate: Holly Tuynman

Date 08/03/2004 Signature

MAIL STOP AMENDMENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Applicant: CHING-WU CHU	§	Conf. No.:	6143
Filed: March 26, 1987	§	Art Unit:	1751
Serial No.: 07/032,041	§	Examiner:	Mark Kopec
For: SUPERCONDUCTIVITY IN SQUARE-PLANAR COMPOUND SYSTEMS	§	Docket No.:	CIP-81297
	§	Customer No.:	01200

RESPONSE AND AMENDMENT

Amendments to the Specification:

A substitute specification including original claims 1-15 is enclosed. The substitute specification includes the specification amendments that were offered by the Preliminary Amendment filed December 4, 1987. A marked-up copy of the substitute specification is also submitted which by underlining and strike-through shows all of the changes relative to the immediate version of the specification prior to the Preliminary Amendment of December 4, 1987. Further, the substitute specification includes one additional amendment at page 25 thereof in Table I which corrects the formula of $NbBa_2Cu_3O_{6+\partial}$ to instead read as -- $NdBa_2Cu_3O_{6+\partial}$ --. This corrects an obvious typographical error. The substitute specification includes no new matter.

Amendments to the Claims:

Please amend claims 56-57, 60-61, 65, 88-89 and 93.

Please cancel claims 16-55, 59, 63-64, 66-87 and 94.

Please add claims 98-99.

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1-15 (Cancelled)

16-55 (Cancelled)

56. (Currently Amended) A composition which is superconductive at a temperature of 70°K and higher, comprising:

a ~~sintered~~ metal oxide ~~complex~~ of the formula

$[L_{1-x}M_x]_aA_bO_y$

wherein;

"L" is ~~scandium~~, yttrium, lanthanum, ~~cerium, praseodymium,~~ neodymium, samarium, europium, gadolinium, ~~terbium~~, dyprosium, holmium, erbium, thulium, ytterbium, lutetium, or mixtures thereof; "M" is barium, strontium, ~~calcium, magnesium, mercury,~~ or mixtures thereof; "A" is copper, ~~bismuth, tungsten, zirconium, tantalum, niobium, vanadium~~; "x" is from about 0.65 to 0.80; "a" is 1; "b" is 1; and "y" is a value from about 2 to about 4 that provides the metal oxide ~~complex~~ with zero electrical resistance at a temperature of 70°K or above.

57. (Currently amended) The superconducting composition of claim 56, wherein "M" is barium ~~or strontium and "A" is copper~~.

58. (Previously presented) The superconducting composition of claim 57, wherein "x" is about 0.667.

59. (Cancelled)

60. (Currently Amended) The superconducting composition of claim ~~59~~ 58, wherein "L" is yttrium, lanthanum neodymium, samarium, europium, gadolinium, erbium or lutetium.

61. (Currently Amended) The superconducting composition of claim 56, wherein the metal oxide ~~complex~~ has the formula

$LM_2A_3O_{6+\partial}$

and ∂ is a number value from about 0.1 to about ~~4.5~~ 1.0 that provides the oxide complex with zero electrical resistance at a temperature of 70°K or above.

62. (Currently Amended) The superconducting composition of claim 61, wherein "M" is barium ~~or strontium, "A" is copper~~.

63-64 (Cancelled)

65. (Currently Amended) The superconducting composition of claim ~~64~~ 62, wherein "L" is yttrium, lanthanum neodymium, samarium, europium, gadolinium, erbium or lutetium ~~and "M" is barium.~~

66-87 (Cancelled)

88. (Currently Amended) A method for making a superconducting metal oxide ~~complex~~, comprising the steps of:

mixing solid compounds containing L, M, A and O in amounts appropriate to yield the formula $[L_{1-x}M_x]_aA_bO_y$ wherein "L" is ~~scandium,~~ yttrium, lanthanum, ~~cerium, praseodymium,~~ neodymium, samarium, europium, gadolinium, ~~terbium,~~ dysprosium, ~~halmium~~ holmium, erbium, thulium, ytterbium, lutetium, or a combination thereof; "M"

is barium, strontium, ~~calcium, magnesium, mercury~~ or a combination thereof; "A" is copper, ~~bismuth, titanium, tungsten, zirconium, tantalum, niobium, vanadium or a combination thereof~~; "a" is 1 to 2; "b" is 1; "x" is about 0.01 to about 1.0; and "y" is a value from about 2 to about 4 that provides the metal oxide ~~complex~~ with zero electrical resistance at a temperature of 40°K or above;

compacting the mixture into a solid mass by application of pressure from about 100 to about 30,000 psi;

heating the solid mass in air to a temperature of from about 800 to about 1000°C for a time sufficient to react the compacted mixture in the solid state; and

quenching the solid mass to ambient temperature in air.

89. (Currently Amended) The method of claim 88, wherein "M" is barium ~~or strontium and "A" is copper~~.

90. (Previously presented) The method of claim 89, wherein "x" is about 0.65 to about 0.80 and "a" is 1.

91. (Previously presented) The method of claim 90, wherein the mixture is compacted to a solid mass by application of pressure of from about 100 to about 500 psi.

92. (Previously presented) The method of claim 91, wherein the solid mass is heated under a reduced oxygen atmosphere of about 2000μ at a temperature of from about 820°C to about 950°C.

93. (Currently Amended) A material containing a sufficient quantity of a superconductive crystalline phase to cause the material to exhibit substantially zero electrical resistance at a temperature of 77°K or above; said crystalline phase composition having the formula $LM_2Cu_3O_{6+\partial}$, wherein "L" is ~~Se~~, Y, La, ~~Ce, Pr,~~ Nd, Sm, Eu, Gd, ~~Tb,~~ Dy, Ho, Er, Tm, Yb, Lu, or mixtures thereof; "M" is Ba, Sr or mixtures thereof; and ∂ is a value from about 0.1 to

about ~~4.5~~ 1.0 that provides the composition with zero electrical resistance at a temperature of 77°K or above.

94. (Cancelled)

95-97 (Not entered)

98. (New) The material of claim 93 wherein L is Y and M is Ba.

99. (New) The material of claim 93 wherein L is, Sm, Eu, Gd, Er, or Lu and M is Ba.

REMARKS

Responsive to the Office Action mailed May 27, 2004, Applicants have studied the Examiner's comments and the cited art. Claims 56-58, 60-62, 65, 88-93 and 98-99 are currently pending. In view of the following remarks, Applicants respectfully submit that the application is in condition for allowance.

All pending claims were rejected under 35 U.S.C. § 112, first paragraph for naming various elements from which it has been said no superconducting composition can be obtained. The independent claims which remain pending are claims 56, 88 and 93. All independent claims have been amended to delete from the elements listed for L the objectionable elements of Sc, Ce, Pr, Tb; to delete from the element listed for M the objectionable elements of Ca, Mg, Hg; to delete from the elements listed for A the objectionable elements of Bi, Ti, W, Zr, Ta, Nb and V. Not deleted as an M element is Sr. In this respect attention is directed to U.S. Patent 6,635,603 (copy enclosed) and Example 4 of the Table at column 8 thereof showing $Y(Ba_{1.5}Sr_{0.5})Cu_30_{9-S}$ as superconducting at Tc=87K. This disproves Dr. Engler's assertions as respects Sr not being a useful element as the M constituent of a superconductor.

By the above-discussed amendment it is believed that the 35 U.S.C. § 112 rejection has been overcome, and there being no further basis for rejection of claims 56-58, 60-62, 65, 88-93 and new claims 98-99, the claims should now be allowed.

The rejection of claims 29-41, 51, 52 and 76 under 35 U.S.C. § 112, first paragraph is now moot in view of the cancellation of these claims.

The rejection of claims 35-46 under 35 U.S.C. § 112, second paragraph is now moot in view of the cancellation of these claims.

The rejection of claims 35-46 and 67-68 under 35 U.S.C. § 102(a)1(b) and/or § 103(a) over Bednorz et al. or Michel is now moot in view of the cancellation of these claims.

CONCLUSION

Applicants respectfully submit that all issues and rejections have been adequately addressed, that all claims are allowable, and that the case should be advanced to issuance.

If the Examiner has any questions or wishes to discuss the claims, Applicants encourage the Examiner to call the undersigned at the telephone number indicated below.

Respectfully submitted

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EXHIBIT B

Marked-up Version of Substitute Specification

APPLICATION FOR PATENT

INVENTORS: CHING-WU CHU

TITLE: SUPERCONDUCTIVITY IN SQUARE-PLANAR COMPOUND SYSTEMS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This is a continuation-in-part of Serial No. 012,205, filed February 6, 1987, entitled "High Transition Temperature Superconducting Composition" which in turn is a continuation-in-part of Serial No. 006,991, filed January 26, 1987, entitled "Superconducting Compositions And Method For Enhancing Their Transition Temperatures By Pressure" which in turn is a continuation-in-part of Serial No. 002,089, filed January 12, 1987, entitled "Superconducting Composition and Method."

STATEMENTS REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] This invention was made with United States Government support under Grant No. DMR-8204173 awarded by the National Science Foundation and Grant No. NAGW-997 awarded by the National Aeronautics and Space Administration, and the United States Government has certain rights in the invention.

BACKGROUND OF THE INVENTION

[0003] This invention relates to superconducting compositions, i.e., compositions offering no electrical resistance at a temperature below a critical temperature; to processes for their production and to methods for their use; and to methods for increasing the superconducting transition temperature of superconducting compositions.

[0004] Superconductivity was discovered in 1911. Historically, the first observed and most distinctive property of a superconductive material is the near total loss of electrical resistance by the material when at or below a critical temperature that is a characteristic of the material. This critical temperature is referred to as the superconducting transition temperature of the material, T_c. The criteria by which a selection of the critical temperature value is determined from a transition in the change in resistance observed is often not obvious from the literature. Many past authors have chosen the mid-point of such curve as the probable

Pages 2-25
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CLAIMS

1. A superconducting metal oxide complex, having the formula $(L_{1-x}M_x)_a A_b O_y$, wherein "L" is scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, samarium, europium, gadolinium, terbium, dyprosium, holmium, erbium, thulium, ytterbium, or lutetium, or a combination thereof; "M" is barium, strontrium, calcium, magensium, mercury, or a combination thereof; "A" is copper, bismuth, titanium, tungsten, zirconium, tantalum, niobium, vanadium or a combination thereof:

"x" is from about 0.01 to 1.0;

"a" is 1 to 2;

"b" is 1; and

"y" is about 2 to about 4.

2. The oxide complex of claim 1 wherein "L" is yttrium, lanthanum, neodymium, samarium, europium, gadolinium, erbium or lutetium, "M" is barium or strontrium, "A" is copper, "a" is 1 and "x" is from about 0.65 to about 0.80.

3. The oxide complex of claim 2 wherein "M" is barium and "x" is about 0.667.

4. The oxide complex of claim 3 wherein "L" is yttrium, lanthanum or lutetium.

5. The oxide complex of claim 1 wherein the oxide complex has the formula

$$LM_2A_3O_{6+\partial}$$

and ∂ has a number value from about 0.1 to about 4.5

6. The oxide complex of claim 5 wherein "L" is yittrium, lanthanum, neodymium, samarium, europium, gadolinium, erbium or lutetium, "M" is barium or strontrium, "A" is copper.

7. The oxide complex of claim 6 wherein ∂ has a number value from about 0.1 to about 1.0.

8. The oxide complex of claim 7 wherein ∂ has a number value of from about 0.1 to about 0.5.

9. The oxide complex of claim 8 wherein "L" is yttrium, lanthanum or lutetium and "M" is barium.

10. A superconducting metal oxide complex having the formula $(L_{1-x}M_x)_a A_b O_y$, wherein "L" is scandium, yttrium, lanthanum, cerium, praseodymium, neodymium, samarium europium, gadolinium, terbium, dyprosium, holmium, erbium, thulium, ytterbium, or lutetium, or a combination thereof; "M" is barium, strontrium, calcium, magensium, mercury,

or a combination thereof; "A" is copper bismuth, titanium, tungsten, zirconium, tantalum, niobium, vanadium or a combination thereof; "a" is 1 to 2; "b" is 1; "x" is from about 0.01 to 1.0; and "y" is about 2 to about 4; said complex made by a process comprising the steps of:

compressing a mixture of solid powdered compounds containing L, M, A and O in proportions appropriate to yield said formula;

heating the compressed powder mixture to a temperature of from about 800°C to about 1000°C for a time sufficient to react the compressed mixture in the solid state; and

quenching said reacted compressed mixture to ambient temperature.

11. The oxide complex of claim 10 wherein "L" is yittrium, lanthanum, neodymium, samarium, europium, gadolinium, erbium or lutetium, "M" is barium or strontrium, "A" is copper, "a" is 1 and "x" is from about 0.65 to about 0.80.

12. The oxide complex of claim 11 wherein the solid compounds containing L are L_2O_3, the solid compounds containing "M" are MCO_3 and the solid compounds containing A are AO.

13. The oxide complex of claim 12 wherein "M" is barium and "x" is about 0.667.

14. The oxide complex of claim 13 wherein the compressed powder mixture is heated under a reduced oxygen atmosphere of about 2000μ at a temperature of from about 820°C to about 950°C.

15. The oxide complex of claim 14 wherein "L" is yttrium, lanthanum or lutetium, "M" is barium and "A" is copper.

ABSTRACT

Described is a superconducting composition comprising an oxide complex of the formula $[L_{1-x}M_x]_aA_bO_y$ wherein L is lanthanum, lutetium, yttrium, or scandium; A is copper, bismuth, titanium, tungsten, zirconium, tantalum, niobium, or vanadium; M is barium, strontium, calcium, magnesium or mercury; and "a" is 1 to 2; "b" is 1; and "x" is a number in the range of 0.01 to 1.0; and "y" is about 2 to about 4. The oxide complexes of the invention are prepared by a solid-state reaction procedure which produces an oxide complex having an enhanced superconducting transition temperature compared to an oxide complex of like empirical composition prepared by a coprecipitation - high temperature decomposition procedure.

With an oxide complex prepared by the solid-state reaction of the invention a transition temperature as high as 100°K has been observed even under atmospheric pressure.

EXHIBIT C

Issue Classification	Application No.	Applicant(s)	
	07/032,041	CHU, CHING-WU	
	Examiner	Art Unit	
	Mark Kopec	1751	

ISSUE CLASSIFICATION

ORIGINAL CLASS	ORIGINAL SUBCLASS	CROSS REFERENCE(S) CLASS	CROSS REFERENCE(S) SUBCLASS (ONE SUBCLASS PER BLOCK)						
505	125	505	126	490	500	780			
INTERNATIONAL CLASSIFICATION									
C04B	101/00								
H01L	39/12								
H01B	12/00								
	/								
	/								

NONE
(Assistant Examiner) (Date)

(Legal Instruments Examiner) (Date) 8/17/05

Mark Kopec 11/08/04
(Primary Examiner) (Date)

Total Claims Allowed: 15

O.G. Print Claim(s)	O.G. Print Fig.
1	1

☐ Claims renumbered in the same order as presented by applicant ☐ CPA ☐ T.D. ☐ R.1.47

Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original	Final	Original
	1		31	5	61	14	91		121		151		181		
	2		32	6	62	15	92		122		152		182		
	3		33		63	8	93		123		153		183		
	4		34		64		94		124		154		184		
	5		35	7	65		95		125		155		185		
	6		36		66		96		126		156		186		
	7		37		67		97		127		157		187		
	8		38		68	9	98		128		158		188		
	9		39		69	10	99		129		159		189		
	10		40		70		100		130		160		190		
	11		41		71		101		131		161		191		
	12		42		72		102		132		162		192		
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	18		48		78		108		138		168		198		
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	24		54		84		114		144		174		204		
	25		55		85		115		145		175		205		
	26	1	56		86		116		146		176		206		
	27	2	57		87		117		147		177		207		
	28	3	58	11	88		118		148		178		208		
	29		59	12	89		119		149		179		209		
	30	4	60	13	90		120		150		180		210		